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Bryan Youngpeter

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MACMILLAN, SOBANSKI & TODD, LLC
ONE MARITIME PLAZA - FIFTH FLOOR
720 WATER STREET
TOLEDO, OH 43604

EXAMINER

FREAY, CHARLES GRANT

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRYAN YOUNGPETER, DALE C. KILLINS,
STEPHEN T. HUNG, TIMOTHY M. STATON,
and SCOTT L. RADABAUGH
Appellant

Appeal 2009-6636
Application 10/631,129
Technology Center 3700

Before: RICHARD E. SCHAFER, JAMESON LEE, and MICHAEL P.
TIERNEY, *Administrative Patent Judges.*

SCHAFER, *Administrative Patent Judge.*

DECISION ON APPEAL¹

Applicants appeal the Final Rejection of Claims 7-11. 35 U.S.C. §
134(a). We have jurisdiction. 35 U.S.C. § 6(b). We affirm.

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE” (paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

STATEMENT OF THE CASE²

An Examiner finally rejected Claims 7-11 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Fujimura³ and Duffy.^{4,5} App. Br. 10; Ans. 2-3.

FINDINGS OF FACT

- F. 1. Applicants' invention relates to a pump that forms part of a power assisted steering system. Written Description ¶¶ 2-3.
- F. 2. The pump includes an electrically powered valve that controls the fluid output of the pump with changing engine and pump speed. Written Description ¶ 7.
- F. 3. At low pump speeds, the entire volume of the fluid is outputted to provide power assisted steering. Written Description ¶ 3.
- F. 4. At higher engine speeds, a portion of the steering fluid is diverted to return to the pump, bypassing the steering mechanism. Written Description ¶ 3.
- F. 5. A flow control valve adjusts the volume of fluid that recycles back to the pump. Written Description ¶ 7.

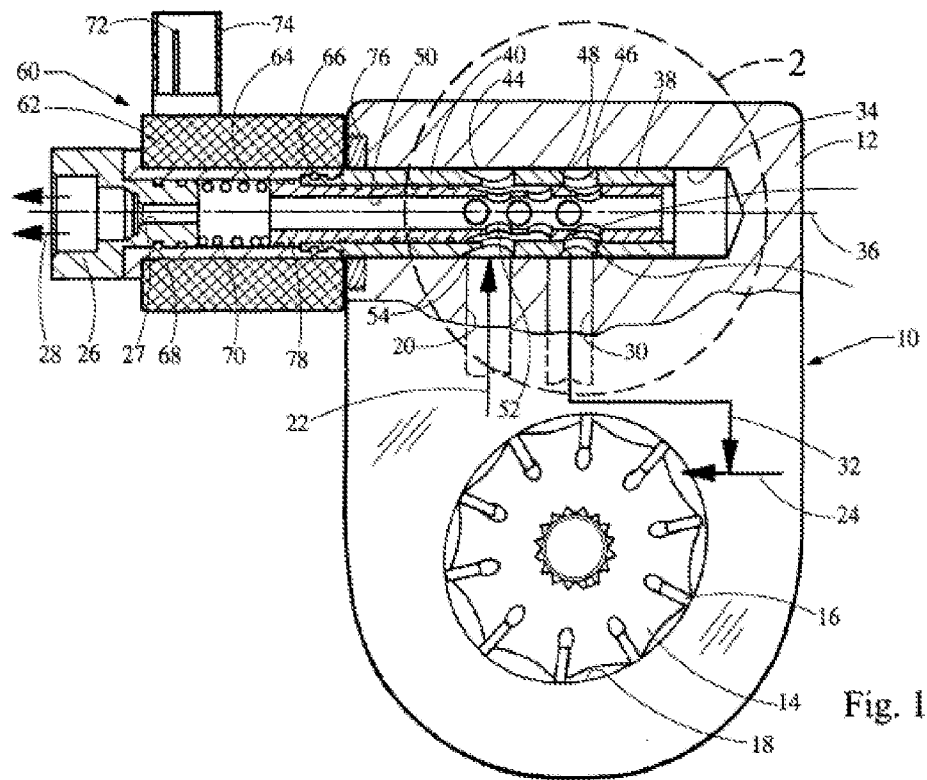
² Throughout this decision, we refer to the Amended Appeal Brief filed September 10, 2007 and the Examiner's Answer mailed September 4, 2008. All references to the claims are to the Claims Appendix of the Appeal Brief. The Examiner has certified those claims as correct. Ans. 3.

³ U.S. Patent 5,860,797.

⁴ U.S. Patent 4,877,099.

⁵ A rejection of Claims 7-11, under the non-statutory grounds of obviousness-type double patenting, has been withdrawn. Ans. 2-3.

- F. 6. The valve employs a conventional solenoid and plunger combination as part of the system controlling the amount of fluid that is recycled back to the pump. Written Description ¶ 8.
- F. 7. Figure 1, reproduced below, shows the pump including the flow control mechanism with the flow control valve (38) positioned in the fully open bypass position. Written Description ¶ 10.



- F. 8. The valve 38 includes a moveable plunger 78 that moves axially within the valve 38 and proportionally controls inlet size of the steering fluid bypass port 30. Written Description, Fig. 1 and ¶ 17.
- F. 9. A coil spring 70 biases the plunger into the open position. Written Description ¶ 15.

- F. 10. The position of the plunger is controlled by means of a solenoid (electromagnetic coil) 62. Written Description ¶ 15.
- F. 11. Activation of the coil generates an electromagnetic field that slides the plunger in opposition to the spring. Written Description ¶ 17.
- F. 12. The position of the plunger depends upon the strength of the electromagnetic field which is determined by the amount of current supplied to the coil. Written Description ¶ 8.
- F. 13. Control of the electric current provides control of the plunger position and control of the volume of fluid passing through the bypass port.
- F. 14. Representative Claim 7, follows:

A power steering pump comprising:

a housing defining a bore having an axis, an outlet adjacent one end of the bore, a fluid discharge port communicating with the bore at a first axial location, and a fluid bypass port communicating with the bore at a second axial location;

pumping elements disposed within the housing for pumping fluid to said fluid discharge port and communicating with said bypass port for drawing fluid therefrom;

a flow control valve slideably received in the bore and defining an inlet to the bypass port;

a plunger operatively connected to the flow control valve and responsive to an applied electromagnetic field to slide the flow control valve to various positions between a fully closed position wherein the flow control valve closes the inlet and a fully open position wherein maximum fluid flows from the bore to the fluid bypass port through the inlet;

a spring operatively coupled to the flow control valve for biasing the flow control valve in the open position;

an electromagnetic coil for applying an electromagnetic field to the plunger to vary the position of the plunger and thereby vary the size of the inlet and to proportionally control fluid flow to the fluid bypass port.

Fujimura

F. 15. Fujimura also relates to a power steering fluid pump. Fujimura 1:5-8.

F. 16. Fujimura's pump includes a "flow rate control device" that controls the amount of fluid output to the steering mechanism. Fujimura 2:4-10.

F. 17. The output of the pump is controlled by diverting a portion of the fluid through a by-pass port back to the pump rather than to the steering mechanism. Fujimura 2:4-10

F. 18. The flow rate control device includes an axial chamber 23 that contains a plunger or "spool valve" 16. Fujimura 4:21-25.

F. 19. The spool valve slides axially in the chamber. Fujimura 3:40-43.

F. 20. The position of the spool valve controls the extent to which the by-pass port is open thus maintaining the pump output constant regardless of pump and engine speed. Fujimura 2:4-10.

F. 21. A spring 17 biases the spool valve towards a position where the by-pass port is closed. Fujimura 3:43-46.

F. 22. The position of the spool valve and the degree the bypass port is opened is controlled by the pressure of the steering fluid. Fujimura 2:4-10.

F. 23. As the pressure increases, the spool valve moves against the spring bias exposing more of the bypass port. Fujimura 4:55 – 5:3.

Differences between the Claimed Subject Matter and Fujimura

F. 24. Fujimura teaches a hydraulically controlled plunger rather than a solenoid and plunger system to control the position of the flow control valve and the amount of fluid sent through the bypass port.

F. 25. Fujimura's flow control valve uses a spring that biases the plunger towards a position where the bypass port is closed while Applicants use a spring that biases the valve towards a position where the bypass port is open.

Duffy

F. 26. Duffy teaches a microprocessor controlled power steering system that allows instantaneous control of the amount of steering assist. Duffy 1:12-16.

F. 27. Duffy's system uses a fluid control valve that controls the amount of fluid sent to the steering mechanism. Duffy 4:17-26.

F. 28. The fluid control unit uses an electrically activated spool valve to divert a portion of the fluid back to the pump. Duffy 4:31-39.

F. 29. The spool valve uses a solenoid and plunger arrangement to control the amount of fluid that bypasses the steering mechanism. Duffy 4:29-39.

F. 30. The fluid control unit includes spring that biases the plunger towards an open position. Duffy 4:28-39 and Fig. 3.

Level of Ordinary Skill in the Art

- F. 31. Based upon the teachings of Fujimura and Duffy, the person having ordinary skill in the art would be familiar with and understand the principles of operation of solenoid and plunger arrangements and hydraulic systems for controlling the amount of power steering fluid sent to the steering mechanism.
- F. 32. Based upon the teachings of Fujimura and Duffy, the person having ordinary skill in the art would recognize that a solenoid and plunger mechanism and hydraulically operated spool valve mechanism are alternative means for controlling the fluid output to the steering mechanism.

ANALYSIS

Applicants have not argued their claims separately. Accordingly, we will decide this appeal on the basis of the subject matter of Claim 7. 37 C.F.R. § 41.37(c)(1)(vii).

Fujimura and Duffy show that the hypothetical person having ordinary skill in the power steering art is aware of both solenoid-based and hydraulic-based fluid control units that adjust the position of a plunger to control the amount of steering fluid sent to the steering mechanism. Additionally, the hypothetical person of ordinary skill would have recognized that Duffy's electrically controlled plunger and solenoid and Fujimura's hydraulically controlled spool valve are alternative means for controlling the rate of fluid delivery to the steering system. Duffy also teaches that an electrically controlled system allows computer control of the amount of steering assist provided to the steering system. It would,

therefore, have been obvious to substitute an electrically controlled solenoid and piston mechanism for Fujimura's hydraulically activated plunger.

Applicants argue that “[n]either Fujimura . . . nor Duffy, suggest steering pump with the elements of the combination as set forth in claims 7-11.” App. Br. 11. Applicants have not specifically identified which of the elements are missing. To the extent Applicants are asserting that neither reference anticipates the claimed subject matter, the argument is simply not relevant. The Examiner, in basing the rejection on § 103, concedes that neither reference is an anticipation. Rather, the rejection is premised upon what the combined teachings of the references would suggest to the person having ordinary skill in the art.

Applicants argue that neither reference provides reason for making the combination and that the combination must come from the references themselves. App. Br. 11, 13. While there must be a reason for combining the teachings of the prior art (*In re Kahn*, 441 F.3d 977, 987 (Fed.Cir. 2006)), that reason need not be expressly stated in the references. “A suggestion, teaching, or motivation to combine the relevant prior art teachings does not have to be found explicitly in the prior art” *Kahn*, 441 F.3d at 987. In any event, Duffy expressly provides a reason. Duffy teaches that the use of a solenoid-based valve allows for microprocessor control of the amount of steering assist. Duffy 2:4-26 and 5:30-45. With the prevalence of the use of microprocessors to enhance control of modern vehicle functions, the substitution of Duffy's microprocessor controllable system for Fujimura's hydraulic system would have been obvious.

Applicants assert that Fujimura does not disclose “a plunger element that is operatively connected to the flow valve and responsive to an applied electric field to slide the flow control valve to various positions between fully closed and fully open positions.” App. Br. 11. Additionally, Fujimura is said not to disclose “a spring that is operatively coupled to the flow control valve for biasing the flow control valve in the open position.” App. Br. 11. Both these features are taught by Duffy. The rejection is based upon the combination of Fujimura’s and Duffy’s teachings. Nonobviousness can not be shown by attacking references individually where the rejection is based upon a combination of references. *In re Merck*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Applicants further argue that Duffy’s valve mechanism functions differently than applicants’. In particular, Duffy’s plunger is said to operate only in a fully open and fully closed position while Applicants’ use proportional positioning. App. Br. 12. Applicants base their argument on Duffy’s Figure 3A showing the shape of the voltage input fed to the solenoid. Applicants infer that the force applied to the plunger and spring 58 would also follow the voltage curve and would be either fully on or off.

Applicants’ argument is inconsistent with Duffy’s express teaching:

To increase the effective force acting in a left hand direction to oppose spring 58, the time of each pulse is increased so that the effective force acting in left hand direction on valve spool 44 is increased.

Duffy 4:43-47. Thus, a longer duration pulse is taught to increase the force opposing the spring. This would result in a larger displacement against the spring force. Thus, the pulse duration is directly linked to the position of the

valve spool/plunger. Additionally, Applicants' "on or off" theory of operation appears inconsistent with Duffy's goal of providing optimum steering for any driving condition including the speed of the vehicle. Duffy, 2:27-33.

Applicants argue that the Examiner did not follow certain provisions of the MPEP. App. Br. 12-13. The MPEP describes the procedures examiner may follow in conducting examination. If the examiner failed to follow procedural requirements, Applicants remedy was by way of petition. This board has no supervisory authority over the procedures used by patent examiners during examination.

Applicant argues that it is not clear how Duffy's spool valve would be substituted for the hydraulic system in Fujimura's pump. We note that Applicants do not assert that such a substitution would be inoperative or impossible to make. In any event, claimed subject matter may be obvious from the combined teaching of the references even if the features of one reference cannot be substituted physically into the structure of the other. *In re Yamamoto*, 740 F.2d 1569, 1573 (Fed. Cir. 1984). We further note that based upon the full teachings of Fujimura and Duffy, as well as Applicants own disclosure, one having ordinary skill in the art would be aware of the principals of operation of both hydraulic and solenoid operated spool valves. Any modifications necessary to adapt Duffy's approach to Fujimura's pump is within the skill of the art. In this regard we note that Applicants' written description does not indicate that any special techniques or arrangement are necessary or critical in using the solenoid and plunger mechanism in connection with controlling fluid flow to the steering mechanism. Nor have

Applicants argued that the proposed combination of teachings was “uniquely challenging or difficult for one of ordinary skill in the art.” *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007).

Applicants contend that Fujimura’s use of a hydraulically controlled spool valve, in and of itself, teaches away from the use an electromagnetically controlled spool valve. App. Br. 11. A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. A reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. *In re Gurley*, 27 F.3d 551, 554 (Fed. Cir. 1994). We see nothing in Fujimura that would dissuade one skilled in the art from using a microprocessor controlled solenoid and plunger mechanism of the type taught by Duffy. Mere failure to mention an alternative known in the art, does not constitute disparaging or discrediting the approach. *See DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (“A reference does not teach away [...] if it merely expresses a general preference for an alternative invention but does not ‘criticize, discredit, or otherwise discourage’ investigation into the invention claimed.”).

Applicants also note that the Duffy reference is older than the Fujimura patent and the failure of the Fujimura inventors to mention a solenoid and plunger system as an alternative supports a holding of non-obviousness:

Since the author/inventors of Fujimura et al did not mention, suggest or even hint at such a modification or substitution while having the presumed knowledge of the earlier Duffy reference, it is highly speculative on the Examiner's part to maintain an allegation of obviousness concerning Appellants claims.

Reply Br. 9.

Obviousness is not determined from the perspective of the inventors or authors of a prior art reference. Rather, obviousness is determined from the perspective of a hypothetical person having ordinary skill in the art. It is only that hypothetical person who is presumed to be aware of all pertinent prior art. *Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985). The knowledge of actual inventors is simply irrelevant to the obviousness determination. *Cyanamid*, 774 F.2d at 454.

Lastly, Applicants assert that the rejection should be reversed because the rejection fails under the “test” of *Graham v. John Deere*: “The rejection being discussed in this brief also fails under that test.” App. Br. 14. We are not sure what Applicants mean by “that test.” *Graham* sets out the considerations that must be made in determining whether an “invention as a whole would have been obvious:”

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

Graham v. John Deere, 383 U.S. 1, 17-18 (1966).

Our review of the record shows that the examiner considered the Graham factors. In relying on the Fujimura and Duffy references, the examiner identified both the scope and content of the prior art and the level of ordinary skill in the art. Applicants could have, but did not, provide evidence that either the scope and content of the prior art or the level of ordinary skill were different than that represented by the Fujimura and Duffy references.

The examiner also identified the differences between the prior art and the claimed subject matter: “Fujimura does not disclose that the plunger is responsive to an applied electromagnetic field to slide the flow control valve, that the spring biases the valve into the open position or that there is an electromagnetic coil for applying an electromagnetic field to the plunger.” Ex. Ans. p. 5.

Applicants have not directed us to any evidence of secondary considerations. Applicants appear to characterize “teaching away” as a secondary indicia of non-obviousness. App. Br. 14. We do not agree that “teaching away” is a secondary consideration and Applicants have not directed us to authority indicating that it is. In any event, an argument that a reference teaches away goes to the existence of a prima facie case of obviousness rather than to secondary considerations that “give light to the circumstances surrounding the origin of the subject matter sought to be patented.”

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CONCLUSION

The subject matter of Claim 7 would have been obvious over the combined teachings of Fujimura and Duffy.

DECISION

We affirm the rejection of Claims 7 and 8-11 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

MACMILLAN, SOBANSKI & TODD, LLC
ONE MARITIME PLAZA – FIFTH FLOOR
720 WATER STREET
TOLEDO, OH 43604